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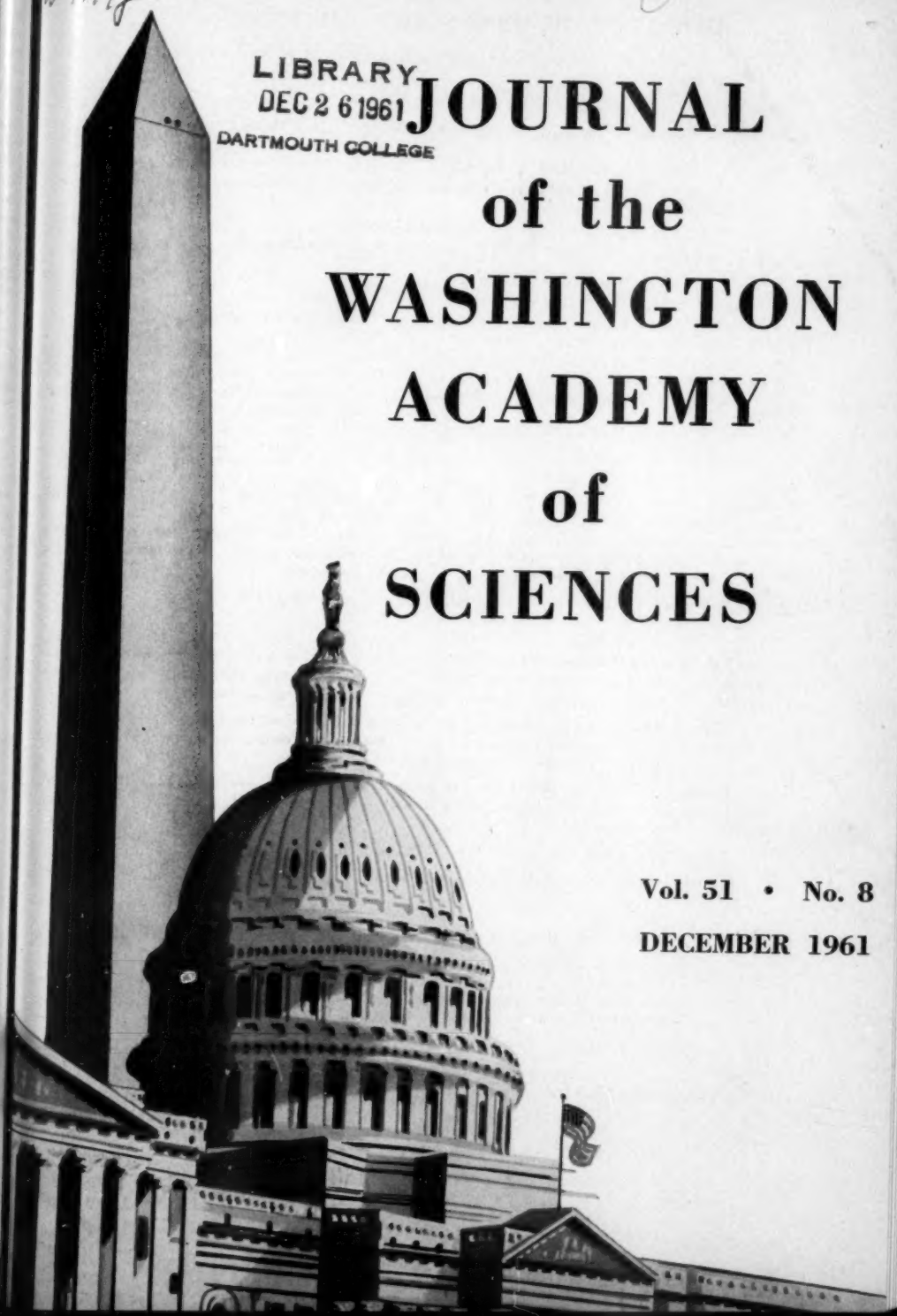

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JOURNAL OF THE WASHINGTON ACADEMY OF SCIENCES

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This Journal, the official organ of the Washington Academy of Sciences, publishes historical articles, critical reviews, and scholarly scientific articles; notices of meetings and abstract proceedings of meetings of the Academy and its affiliated societies; and regional news items, including personal news, of interest to the entire membership. The Journal appears eight times a year in January to May and October to December.

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Is Plant Pathology a Fake?*

Russell B. Stevens

Professor of Botany, George Washington University

Several years ago, at the very last session of an elaborate Golden Jubilee celebration of the American Phytopathological Society, J. G. Horsfall spoke to the problem of plant pathology as an art and as a science. There were only a few score of us in attendance, but the argument was well put and convincing—fortunately it has since become available in print.** In essence we were urged to recognize that what we call plant pathology has two aspects: (1) the art of disease diagnosis and control; and (2) the science of disease investigation. It was even suggested that there be different curricula and separate advanced degrees for individuals looking toward one or the other of these areas of effort.

Certainly there is an art of plant pathology. Our title might then have been more precisely put, "Is the science of plant pathology a fake?" or, less flamboyantly, "It there a science of plant pathology?" We shall address ourselves to this point from here on.

By whatever standards one chooses to apply, plant pathology has many dimensions. The causal agents of disease run from the inanimate to the animate; from viruses to flowering plants. The crops affected are horticultural and agronomic, cultivated and uncultivated, commercial and private, marketable and ornamental, and are involved anywhere from seedling to adult, from planting to consumption. Host-parasite relations are specific and non-specific, local and systemic, in the aggregate affecting all parts in all ways. Most important, we plant pathologists are forced to the conclusion that what we do is a synthetic or derivative discipline; that is, we are involved with genetics, with physiology, with taxonomy, with soil science, with mycology, with virology, with nematology, and so on. The basic issue, then, is whether, when we remove, so to speak, the contributions of these supporting areas, there is anything left. Is there anything which belongs to pathology alone? If it is properly to be called a science, there must be unique points of view, concepts, and methods of attack. Does it have these?

Let me assume that there is something left and examine the implications of the position plant pathology occupies. I think they might be stated as follows:

1. Pathology faces, in exaggerated form, the dilemma of biology vis-a-vis mathematics, physics, and chemistry. Just as the biologist is unavoidably a less-than-professional mathematician, physicist, and chemist, so the plant pathologist is destined to be a second-rate geneticist, physiologist, microbiologist, and agronomist in pursuing his pathology. Sheer time and labor limitations make this inevitable; one cannot hope to be wholly competent in the contributory areas.

2. As a science compounded of others, plant pathology's unique problems and points of view appear only belatedly to oncoming scientists. Many promising students are lost along the way to the more clearly defined disciplines, and we must, on the average, settle for less than our share of the talent available when in truth, perhaps, we need more.

3. The problems of special interest to

* Adapted from an address before the Botanical Society of Washington, October 3, 1961.

** Horsfall, J. G. A Look to the Future—the Status of Plant Pathology in Biology and Agriculture. *In* Holton, C. S., ed. Plant Pathology—Problems and Progress 1908-1958. The University of Wisconsin Press, pp. 63-70 (1959).

pathology have not usually the elegance and precision so appealing to the research man and fashionable today.

Two rather recent personal experiences described below may illustrate the points just enumerated.

We have just completed a ten-year survey of pertinent material in the USDA library and have prepared a so-called bibliography of reviews, including doctoral dissertations. In the more than 2,500 items turned up there was certainly no dearth of reviews and theses in fields contributory to pathology, but there were very few in what I would call pathology, *per se*. Yet our sample of this kind of literature should, if anything, be biased in favor of the broad point of view.

A committee, of which I am a member, is now well along in preparing a "sourcebook" of laboratory and field exercises to be used in the introductory pathology courses. We started out to solicit those exercises already in use, stressing in our appeal that we wanted exercises which bore on what, for lack of a better term, we had to call "principles" of plant pathology. As I recall it, we got none whatsoever. True, there were plenty of exercises in mycology, in one or another symptom expression, in nematology, and so on, but none that could not have appropriately belonged in a supporting discipline or in a course on the art of pathology. It has apparently not occurred to teachers of plant pathology to teach the science of plant pathology; they teach either the art of pathology or the science of something else.

This is not the place to describe the practice of plant pathology as an art or to summarize the work of its supporting disciplines. The work is generally of high caliber, well staffed, and adequately supported, but hardly of first priority. My special plea is for attention to that ill-defined group of problems which have more than once been dubbed unfashionable. However, I do not plead for them because of their unfashionable status—however this might add to their charm—but because I am persuaded that they, and they very nearly alone, constitute the science of plant pathology. Unless we emphasize them, our science is a fake.

It is embarrassingly difficult to cite examples of what I have in mind. Much contemplation has brought to my attention fewer than a dozen, though there must be others. These are, briefly, and in no conscious order of importance:

1. Analysis of disease loss.
2. Social impact of disease.
3. The disease aspects of introducing our domestic varieties into foreign areas.
4. The geographic origins of pathogens.
5. Inoculum potential and dynamics.
6. The logistics of vector activity.
7. Epidemic patterns.
8. Disease forecasting.
9. Instrumentation in pathology.
10. Biological warfare research (not on the basis of its possible use in conflict, but because valuable insights might be obtained should we completely reverse our traditional approach; e.g., by trying to make disease worse experimentally, we might discover unpredictable data on how better to control it).

Some of these areas are hardly touched, while others have received a bit more attention, and I doubt that it would be appropriate to detail the existing literature on any one of them. But whether or not this list is complete, whether or not it has inaccuracies, these are, with no crucial exceptions, programs which are peripheral to plant pathology as it is now carried on. They tend to be carried out by men already established in more orthodox fields, or to be done as a sort of spare time activity. And, incidentally, they receive more attention in foreign countries, whatever that may imply. We do not find graduate students willing to risk specializing here, and I think we must somehow remove the barriers to vigorous prosecution of these, to me, core items. True, some may re-

quire sophisticated methods—operations research, systems analysis, mathematical models, whatever these popular terms mean. But first we must make a start on improving the climate of opinion.

It will be difficult to find graduate students willing to undertake this kind of research, and even more difficult to arrange interdepartmental programs for them, once we have them ready to begin. Indications are that money for research grants can be got only with great difficulty in competition with the narrower fields. It may be hard to find jobs for the products of the graduate program once they are ready. These make more difficult, but they do not rule out, the successful accomplishment of the objective.

My final answer, then, must be: There is an art of plant pathology. The science of plant pathology, as we now do it, is largely a fake. But it need not be, if we will stop concentrating on things that *contribute* to plant pathology and start working on those things which *are* plant pathology. The first job is to get rid of the unwarranted procedural and psychological barriers that get in our way.

Membership to Vote On Officers, Dues Increase

Annual elections of Academy officers for 1962 will be held in December, as usual, by mail ballot. Not later than December 15, the secretary will send out, for approval of the membership, the following slate of candidates selected by the Nominating Committee:

For president-elect: Heinz Specht of the National Institutes of Health.

For secretary: George W. Irving, Jr., of the Agricultural Research Service, USDA.

For treasurer: Malcolm C. Henderson of Catholic University.

For manager-at-large, 1962-64 (two to be elected): Bernice Eddy (NIH), Kathryn Knowlton (NIH retired), Harold H. Shepard (USDA), and Russell B. Stevens (GWU).

For manager-at-large, 1962-63: Leo Schubert (American University). Dr. Schubert would replace Herbert Freidmann, who has left the Washington area.

To be valid, the ballots must be returned to the secretary before the first Thursday in January.

The new officers will take office at the close of the annual meeting in January. At the same time, Benjamin D. Van Evera, current president-elect, will automatically assume the presidency.

Previously-elected managers-at-large who will continue in office during 1962 are W. G. Brombacher and A. O. Foster (class of 1960-62), and A. F. Forziati (class of 1961-63).

Delegates to the Board of Managers, in accordance with the recently-revised bylaws, will continue in office until new selections are made by the respective affiliated societies.

Concurrently with the election of officers, the membership will be asked to approve an increase in annual dues from $6 to $10 for resident members, and from $5 to $7.50 for non-resident members. This action was unanimously endorsed by the Board of Managers at its meeting of October 3. (See also President Abelson's message on the dues increase, and the notes on the October Board meeting, elsewhere in this issue.)

A Message from the President—

The Proposed Dues Increase

You have been asked to consider increasing your dues to the Washington Academy of Sciences. Your Board of Managers has unanimously and emphatically recommended that you vote to change dues of resident members from $6 to $10 a year and of non-resident members from $5 to $7.50 a year. I want to tell you why I concur with this recommendation and join in asking you to vote for this increase.

Those who work for the Academy are proud of it. It is the organization for the advancement of science in the Washington metropolitan area, a local counterpart of the American Association for the Advancement of Science. Being local, it stresses service to the community, the advancement of science being a by-product of its activities. It is the one organization in Washington that can act and speak for all the scientists of this area. It has performed much valuable services in many ways, particularly in relation to secondary education. An outstanding recent example was participation in a week-long Institute on Isotopes and Radioactivity.

It had become obvious that this community needs to know more than it does about radioactivity, its hazards and its benefits. "Fallout" is an ominous word now known to everybody. Scientifically, what lies behind it? What does it really mean and what can we do about it? The Academy and its Joint Board of Science Education decided to act through the secondary schools of this area. With the cooperation of the Carnegie Institution of Washington, the school systems of the area, the Institute of Nuclear Studies at Oak Ridge, Tenn., and other groups, a short course on radioactivity and its effects was organized for the science teachers of our secondary schools. Conducted at the headquarters of the Carnegie Institution, the course consisted of morning talks by the best lecturers obtainable, followed by afternoon laboratory work using equipment for the detection and estimation of radiation, including more than 40 Geiger counters. While these teachers were away from their own classes, other scientists—members of the Secondary Schools Contacts Committee or scientists procured by them—were substituting in the schools.

The foregoing is only one example of the public service that the Academy provides. In addition, it offers frequent lectures on various important scientific subjects, as well as on important topics of more general interest. Lectures are open to teachers, students, and all others who are interested. Here, scientists of different disciplines get to know one another and to broaden their outlook. The Academy provides stimulation and guidance for its Junior Academy. It seeks out and publicly recognizes the younger professional scientists who are making their mark in research or teaching. It publishes this *Journal*, reflecting the scientific life of this area and the subjects discussed in meetings of the Academy and of its affiliated societies. It will publish, we hope, a joint directory of the members of the Academy and its affiliated societies. On controversial, science-connected questions, the Academy can take a public position.

One could go on at length pointing out the accomplishments and potentialities of the Academy. Even greater accomplishments can be attained if we get behind it with more dollars, greater attendance at meetings, more contributions to the *Journal*, and proposals of many more scientists for membership. The Washington Academy of Sciences can be a great organization. Let's make it so!

—*Philip H. Abelson*

Radioisotopes Institute Proves Big Success

A week-long institute, or special course, on "Isotopes and Radioactivity," designed to acquaint secondary school science teachers of the Washington area with the role of radioactive isotopes in science and civil defense, was held October 30-November 3 at the Carnegie Institution of Washington. It attracted much favorable attention from the press, radio, and television, and drew enthusiastic praise and thanks from the participants.

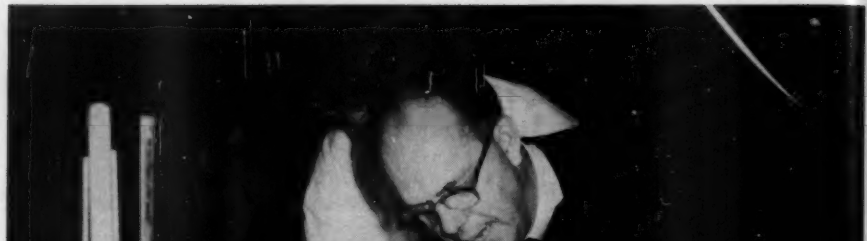
Conceived by Philip H. Abelson, president of the Washington Academy of Sciences, the Institute was sponsored by the Academy and the Joint Board on Science Education. At the request of Dr. Abelson, the morning lecture and afternoon laboratory curriculum was organized by Ralph T. Overman, chairman of the Training Division of the Oak Ridge Institute of Nuclear Studies. About 140 teachers from parochial, private, and public schools were released from their classrooms to take this intensive course, one or two from each school. Their classes were met by scientists and engineers who had volunteered through the Joint Board to substitute for them.

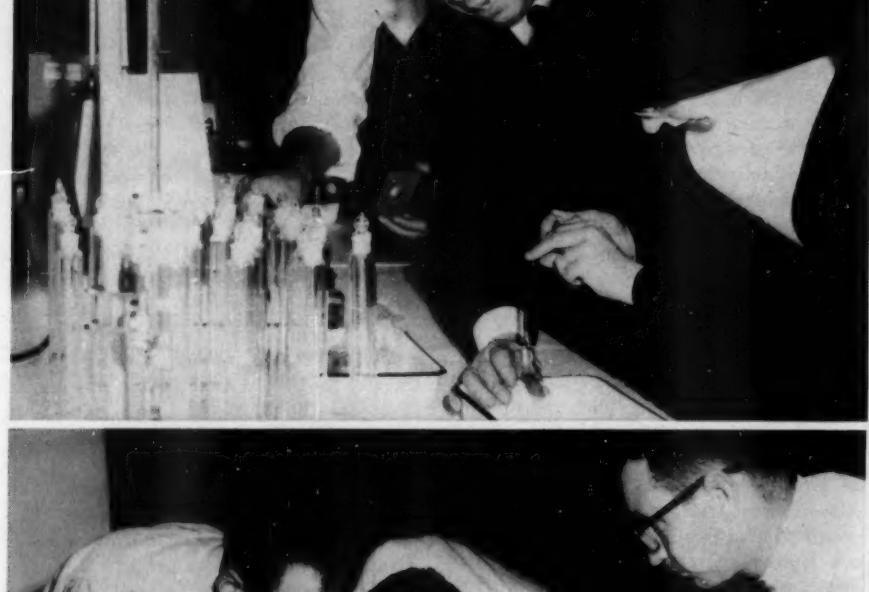
The first meeting of the Institute, in the auditorium of the Carnegie Institution, was attended not only by the chosen teachers but by many interested members of the Academy. Dr. Abelson sounded the keynote of the Institute. Discussing its objectives, he said,

"Atomic energy already has many important applications in scientific research and technology, and these uses are certain to expand greatly in scope and importance. The increasing role of reactors in furnishing energy for electric power competitive with other fuels is a step toward the day when almost all of civilization's energy needs will be met by atomic energy. Radioactive isotopes are employed in virtually every branch of experimental science and the uses are increasing rapidly, especially in chemistry and the medical and biological sciences. Radioactive isotopes are especially useful in performing many simple but instructive experiments which can be a means of interesting students in science. In view of these factors, the teaching of additional information on radioactivity would be desirable even if there were no fallout problem.

"Attaining a maximum capability of living with radioactivity is one of the most important problems facing the nation today. Unfortunately, the present level of knowledge throughout the citizenry is extremely low. As a result, many millions of lives could be needlessly lost in panic, and many more from failure to deal properly with fallout. Radioactivity is now inexorably part of our lives, and we must know enough to behave rationally in any circumstance. Even the briefest training could save many lives, just as practice fire drills have prevented many tragedies. If we adults are responsible citizens, we will try to give the young an enhanced chance of survival.

"The practical mechanism for teaching almost any subject is through the schools. Eventually all students in the secondary schools should receive instruction in the fundamentals of radioactivity. Unfortunately, only a few high schools are capable of giving such training. In part the deficiency is in equipment, but principally the problem is lack of trained instructors. Under normal circumstances, many years might elapse before this latter deficiency would be overcome. In view of the urgency of the problem, unusual measures should be taken. A desirable objective is that at least one teacher in each high school of





the nation should be capable of giving instruction in radioactivity. The essential information could then be disseminated if the knowledgeable instructor taught other teachers and also the students. The Institute on Isotopes and Radioactivity will largely fill this objective for the metropolitan area of Washington. Thus, it could be a useful model for other areas in the country."

Dr. Overman was the principal lecturer of the Institute. One teacher of long experience was heard to call him a virtuoso. He lectured first on nuclear reactions and modes of radioactive decay, speaking with extraordinary grace and clarity and using a blackboard to illustrate the concepts involved. A coffee break was followed by a lecture by Paul C. Aebersold, director of the Office of Isotopes Development, Atomic Energy Commission, on uses of isotopes in industry. Then came a short report by Richard Banks of D.C.'s Stuart Junior High School, on the use he had made of radioactive tracers in his classes.

At the end of the morning session, the guests departed and lunch provided by the Carnegie Institution was served by a caterer to the teachers and their instructors in an adjacent room. Each teacher was given a schedule of assignments in the laboratory, and thus knew the names of his instructor and the three teachers with whom he would work. There were six sections and instructors and six groups of teacher-trainees in each section. Within two minutes after the teachers entered the laboratory, they were at their Geiger counters, immersed in their afternoon's measurements.

The activities of the remaining four days were like those of the first. Every morning Dr. Overman called for questions on the previous day's work. Then he lectured on successive days on detection of radiation, interaction of radiation with matter, characterization of radiation, and radiological safety. Each day a different lecturer followed Dr. Overman.

Charles W. Shilling, M.D. (Capt. USN ret.), recently deputy director of the Division of Biology and Medicine, Atomic Energy Commission, and now director of the Biological Sciences Communications Project, American Institute of Biological Sciences, gave a splendid example of oral communication with visual aids when he lectured on the biological and medical uses of isotopes and biological effects of radiation.

James L. Liverman, chief of the Biology Branch of the above-mentioned Division of the Atomic Energy Commission, talked on the uses of isotopes in agriculture, citing the eradication of the screw worm fly, a serious pest of cattle, from the southeastern United States by the release of millions of artificially-reared flies sterilized by exposure to radiations from an isotope of cobalt.

W. Wayne Meinke, Department of Chemistry of the University of Michigan, lectured on uses of isotopes in chemistry.

Walmer E. Strope, director of research, Office of Civil Defense, talked on "Radiation and Civil Defense" and showed a motion picture on the test occupancy of a fallout shelter by several families with children.

Laboratory instructors included Wilfred Mann and S. B. Garfinkel of the National Bureau of Standards; Richard Banks, William J. Saunders, Keith Johnson, Stephen Hopkins, and Archie Lucas of the D.C. Public Schools; and Patrick L. Parker of the Geophysical Laboratory, Carnegie Institution. Health physicists Abraham Schwebel and Thomas G. Hobbs of the National Bureau of Standards also took part in the laboratory work. The subjects of laboratory work were Geiger

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UPPER—WAS President Abelson assists a teacher participant in pipetting a 10-microliter sample of Cl^{38} solution from an Erlenmeyer flash. The sample, prepared in the University of Maryland reactor, will be dried and its half-life determined in a Geiger counter.

LOWER—Five teachers participating in the course examine the workings of a monitoring apparatus used by OCD.

counter experiments, isodose plot with ionization chamber, tracer experiments, detection of fallout, and autoradiographic localization of radioactivity.

The lecturers were impressed by the alertness and attentiveness of the teachers, and the laboratory instructors by their efficient work. At the end of the week the teachers were asked to evaluate their experience in the Institute. Some of their comments follow:

"I was most impressed with the clearness of the presentations. As a former science teacher of 25 years ago, I have felt that up-dating my general information in terms of present day knowledge could not have been packaged with any greater density. I am most grateful to all individuals and organizations for being permitted to be a party to this institute. In terms of today's living, I would say that no other area needs greater training for effective adjustment to future living."

"I'd like to express my very sincere gratitude for the opportunities offered to me this week. I found the lectures most informative, the lab set-up complete and convenient, the instructors patient and helpful, and the entire experience most educational. By sharing the information I have gained with my fellow teachers and students, I feel that I can be helpful in urging action toward safety preparations and promoting some clear, basic concepts of radiation danger.

"The friendly spirit of all connected with the Institute has certainly strengthened my faith in our way of life. I shall remember all these good people in my daily prayers."

"I feel that this was a rare opportunity—I hope that it will be repeated in many other areas in the very near future. I feel that the value to others not at this Institute will depend to a large degree on the ease and ability to obtain sample isotopes and equipment to use in passing on this wonderful experience and knowledge."

"This week has been very stimulating. It certainly gives me an opportunity to re-evaluate my program at school and include some materials on radioactivity. I feel more confident in the handling of these materials now. It is my hope that this kind of training will continue."

"I was very grateful for the opportunity. Everything was beyond my best expectations. You have even motivated me to take the NSF course in radiation chemistry that will be offered at American University next fall.

"The first lecture by Dr. Overman on the structure of the atom, etc., will be of great use to me in teaching chemistry. I appreciate it most of all."

"I think this has been one of the most beneficial experiences I have yet had from 'teacher institutes.' There was a good balance of lab experience with lecture presentation, both conducted on a level high enough to challenge and stimulate thought.

"My interest now is to find out even more in this field.

"The main difficulty in the school will be to find the time to set up the equipment and use it. In general much of the material will be wasted unless more time can be provided to present this material."

"I am very grateful for this opportunity, and intend to incorporate much of what I've learned into an adult education program which our community is launching."

"This institute has been extremely valuable and beneficial. It has served the purpose of presenting information of current importance in regard to isotopes and radioactivity which, in turn, permits the teacher to have a better and informative background for presentation to students."

"This week was highly informative to me. The momentum of the work gave no lag in time—in fact, time was too short to do the many things one wished to do. I feel I received more from this week's work than many full semester courses I have taken in advanced physics in universities. At least this was better handled than in many college courses."

"More institutes on this and other topics would be of tremendous help. Contact with professional experts is invaluable."

"The spirit of endeavor, the excellence of the lecturers and administrative effort displayed in the institute warrant the highest commendations. I am happy to have been a participant in this program."

"I have greatly benefited from every part of this Institute. There was a wealth of material gained, explained, and appreciated. We are very grateful, and have a great admiration for all you have done for us. We will try to reach out with all you have given us to those we can help."

Dr. Abelson wishes it were possible to name here all the participants in the Insti-

tute and all who helped to make it possible directly or indirectly. The Geiger counter equipment was provided by the Picker X-Ray Corporation, Nuclear-Chicago Corporation, Baird-Atomic, Inc., and Tracerlab, Inc. Civil Defense equipment was lent by the D.C. and Olney Regional Offices of OCD, and demonstrated by Cosmo J. Liberti of the Olney Office. Irradiation services were performed by the University of Maryland reactor and the Oak Ridge National Laboratory facilities. In addition, samples of fallout materials were furnished by Luther Lockhart of the Naval Research Laboratory. An apparatus for collecting fallout materials was lent by Frank B. Conlon, of the Division of Radiological Health, Public Health Service.

The logistics of the Institute were handled by staff members of the Carnegie Institution of Washington, including Philip H. Abelson, A. David Singer, F. A. Rowe, J. L. England, and E. J. Shipley of the Geophysical Laboratory; and Ellen Flack, Ailene Bauer, Joe Holdaway, and Leroy Dabney of the Administration Office, as well as Harold H. Young of the Atomic Energy Commission.

A most important indirect part was played by the Secondary Schools Contacts Committee of the Joint Board on Science Education. Walter H. McCartha is chairman of this committee and Grover C. Sherlin, vice-chairman. The members of the committee are scientists and engineers, one for each secondary school, who link science and technology in their schools with professional science and engineering outside. They are organized into eight divisions; i.e., two for the District of Columbia, two for the surrounding counties in Maryland, two for the surrounding counties in Virginia, one for the parochial schools, and one for the private schools of the whole area—a total of 217 schools. Each division has its own chairman and vice-chairman. This is the organization that provided, from the professional scientific and engineering community, volunteer substitutes for the teachers who attended the Institute.

One of the projects of the Joint Board is the development and maintenance of a list of scientists and engineers, with their telephone numbers, who have expressed willingness to help the secondary schools in various ways. Copies of this list were in the hands of the chairmen of the divisions of the committee and were used by them for making the contacts necessary to procure the needed substitutes. Because very few volunteer substitutes could or would undertake to serve for 5 days, it was necessary to find up to ten or more substitutes for each absent teacher. That meant that several hundred substitutes had to be obtained in one way or another. Sometimes contacts were made by the science supervisors of the school systems and sometimes by administrators in agencies employing scientists or engineers. Some substitutes were professional teachers who were paid by the schools; in other cases professional substitutes attended the Institute. All in all, there was a sort of marvelously controlled nuclear reaction within secondary science education in this area, leading undoubtedly to new knowledge and ideas among the substitute teachers as well as among the members of the Institute.

Frank Drake Is Speaker At Christmas Lectures

The tenth annual Christmas Lectures for students and their teachers will take place at Lisner Auditorium, George Washington University, on December 21 and 22 at 8 o'clock. Frank D. Drake, associate astronomer at the National Radio Astronomy Observatory, Green Bank, W.Va., will lecture on space science.

The Christmas Lectures, sponsored by the Philosophical Society of Washington, are designed primarily for high school and advanced junior high school students. Each year a distinguished scientist is brought to the area to present illustrated lectures on recent scientific developments.

Dr. Drake's first lecture is entitled, "Searching for Life in Space." The possibility of living things beyond the earth will be discussed, and methods used to search for them will be described. These involve the use of space probes; another technique is concerned with radio astronomy. The detection and interpretation of such signals will be demonstrated.

The second lecture is entitled, "Cosmic Radio Waves." The radio emission from the planets of the solar system will be described, together with a discussion of how the study of this emission helps us to design space probes that will study these planets.

Dr. Drake is a graduate of Cornell and Harvard Universities. From 1955 to 1958 he was associated with the Agassiz Station Radio Astronomy Project of Harvard University, where he worked principally in 21-cm. astronomical research and in infrared techniques, as well as in optical astronomy. In 1960 he headed Project Oyma, the just-organized high sensitivity search for extra-terrestrial intelligent radio signals.

Admission to the lectures is by free ticket. Requests, accompanied by a self-addressed stamped envelope, should be sent to Prof. N. T. Grisamore, School of Engineering, George Washington University, Washington 6.

THE BROWNSTONE TOWER

"It would be foolish to allow ourselves to be panicked into a system of higher education entirely subservient to our technological needs. The logic of survival demands that we nourish the philosopher along with the physicist." This quotation from an editorial in the *New York Times* will serve as our text for today.

Some nourishment for science is required if scientists are to emerge from our schools in larger numbers than in the past. How much and what kinds of nourishment are needed for the best results? Is it possible to overnourish our budding scientists, to be to solicitous, to disturb them and their teachers by providing too many "programs" for their benefit? This possibility is worth examining by the techniques of social science. The granting agencies of the Federal government seem to assume that nothing but good for the country can come from the expenditure of money for the encouragement of science talent, the support of scientific research, and the training of science teachers. Every imaginable program for these purposes is being tried, as if to get a winning ticket by betting on every horse in a race.

We should stop concentrating on the production of scientists and instead encourage the production of scholars of all kinds, including scientists. My humanistic background tells me that more philosophers are needed inside and outside of government to apply common sense, or wisdom, where scientific data are lacking and that our nourishment for the production of scholars should include support for the humanities.

Students need, above all, opportunity to read widely and reflect, to talk among themselves and with their teachers, and to develop their philosophy of life; that is, to become scholars. If thereby a student comes to admire science as a way of life in pursuit of demonstrable truth and at the same time has faith in the brotherhood of man and love for literature, art, music,

sport, nature, etc., he will be a credit to science and an asset to the world.

Feeling as I do about the importance of providing opportunity for true scholarship, I was pleased to be invited to serve on the Advisory Council of the U. S. Army Junior Science and Humanities Symposia Program. Its first objective is "To promote the study of the sciences and mathematics, particularly at the high school level; to demonstrate the part which the humanities play in the development of the scientist; to emphasize the importance of both the sciences and the humanities to the national culture and general welfare." A JSH symposium may include papers by selected students, scientists, and humanists, observation and discussion of professional research in progress at or near the site of the symposium, free time for students to talk with one another, and career counseling, all within a period of three days. Such an experience, without fanfare and without any atempt to sell science or the Army's need for scientists, could not be harmful and might help a budding scholar to find himself.

What of the Radioisotopes Institute described in this issue? Was it a worthwhile endeavor? I think it was. It had a very practical purpose, not to sell science but to seed a knowledge of radioactive isotopes and their uses and abuses among the science teachers as a means of propagating this knowledge among students and other teachers. Coming as it did, by chance, just after the explosion of the 50 megaton bomb in the USSR, it had an extraordinary impact. It also demonstrated the wonderful ability of the members of this scientific community to cooperate and do promptly what needs to be done without benefit of a Federal grant. I am proud of the Washington Academy of Sciences and its president, and of all who helped him.

—*Frank L. Campbell*

BOOK REVIEW

JOSEPH HENRY—TRAILBLAZER OF AMERICAN SCIENCE. Sarah R. Riedman. 224 pages. Rand McNally & Company, Chicago, Ill. 1961. Price $3.50.

There are many things which educated Americans know about Joseph Henry: that he discovered electromagnetic induction and self-induction, the coefficient of which, the unit of inductance, is called the "henry"; that he constructed the first electric motor and invented the telegraph; that he was the first Secretary of the Smithsonian Institution. But there are many things that are not well known about this modest and self-effacing scientist which Washington scientists particularly will be interested to learn, since he made Washington the cradle of American science and instituted many scientific activities of the United States Government which since have been largely expanded in the service of science and country for the welfare and security of the Nation.

When James Smithson, the illegitimate son of the first Duke of Northumberland and a noted mineralogist, left a modest fortune of half a million dollars to the Government of the United States to establish "an institution for the increase and diffusion of knowledge among men," there was no better man to nominate as Secretary of the newly founded institution than the professor at the College of New Jersey (now Princeton University). It is a matter of record that this institution owes its existence as much to Henry as to Smithson, because it was Henry who, with an iron will and unmatched energy, protected Smithson's heritage against being squandered on petty pet projects of influential legislators, and, keeping faith with the intention of the donor, made the Smithsonian Institution what it is today, a focal point of American science.

It is not generally known that Henry, in addition to his epochal discoveries in the fields of electricity and magnetism, made

notable contributions in many other fields of science, especially in optics, acoustics, and meteorology. In less than ten years he established lighthouses on the 10,000 miles of shoreline of the United States, and equipped them with modern Fresnel lenses beaming the rays into parallel bundles. He helped mariners also by creating, on the basis of acoustic research, powerful sounding devices that could be heard in dense fog 20 miles away. In his capacity as Secretary of the Smithsonian Institution, Henry created the first National Herbarium, the first Zoological Park, the Bureau of Ethnology, and the U.S. Weather Service with volunteer watchers mapping daily atmospheric conditions and using the telegraph for their transmittal in order to make daily weather forecasts. With the help of the prominent naturalist, Spencer Fullerton Baird, he made a study of food fishes in coastal waters and thus laid the groundwork for the U.S. Bureau of Fisheries.

As the United States extended its frontiers to the West, he organized and facilitated numerous geographical and geological expeditions into uncharted territory, and it was his knowledge of the fish, timber, and mineral resources of Alaska that induced him to recommend the acquisition of Alaska from Russia in 1867. Realizing the difficulty which the scientists of his time had in procuring foreign publications, he instituted at the Smithsonian Institution an international exchange and distribution service as well as a bibliographic classification of scientific data.

If this sounds quite modern, it was the man who in his thinking was far ahead of his contemporaries. In the 1860's, when the spiritualistic craze was sweeping Washington and even the family in the White House, it was Henry who unmasked the impostors. When the battle over Darwin's "Origin of Species" raged among American scientists, not even his best friends Agassiz, Torrey, and Guyot could swerve him from his conviction that all known facts pointed to the theory of evolution as "the best working hypothesis of the naturalists." Not only his thinking, but also many of his endeavors, are far advanced. During the Civil War he sent a balloonist up from the Smithsonian grounds and kept contact with him by wire, sending messages on observations by telegraph to President Lincoln. Thus the Smithsonian Institution became the midwife of the U.S. Air Force. And when the wounded—friends and foes alike—ran out of disinfectants, he ordered his staff at the Smithsonian Institution to prepare much-needed chemicals.

As a true scientist, Henry was always interested in the natural laws underlying observable phenomena, and as a practical man he was quick to realize their applicability. "All knowledge is useful," he wrote in one of his annual reports of the Smithsonian Institution, "and the discovery of today, though appearing unconnected with any useful process, may in the course of a few years become the fruitful source of a thousand inventions." This maxim may well serve scientists of our time as a keynote for action, and our Government in directing scientific activities.

In writing the biography of this remarkable man and farsighted scientist who was largely responsible for the founding of the National Academy of Sciences, the American Association for the Advancement of Science, and the Philosophical Society of Washington, Dr. Riedman not only provided much needed knowledge about the life and work of a real "trailblazer of American science," but also contributed greatly to a better understanding of the growth of the American scientific community and its institutions. Although the book is filled with a wealth of otherwise not easily obtainable information, it is a work of love for a most lovable personality which will be an inspiration to its readers.

—Francis J. Weiss

Science in Washington

SCIENTISTS IN THE NEWS

This column presents brief items concerning the activities of members of the Academy. Such items may include notices of talks given, important conferences or visits, promotions, awards, election to membership or office in scientific and technical societies, appointment to technical committees, civic activities, and marriages, births, and other family news. Formal contributors are assigned for the systematic collection of news at institutions employing considerable numbers of Academy members (see list on masthead). However, for the bulk of the membership, we must rely on individuals to send us news concerning themselves and their friends. Contributions may be addressed to Harold T. Cook, Associate Editor, U. S. Department of Agriculture, Agricultural Marketing Service, Room 2628 South Building, Washington 25, D. C.

APPLIED PHYSICS LABORATORY

A. M. Stone, technical assistant to the director, attended the 15th National Conference of Research at San Juan, P. R., October 9-15. From October 19 through October 22, Dr. Stone participated in the third Strategy of Peace Conference at Airlie House, Warrenton, Va.

COAST AND GEODETIC SURVEY

E. M. Roberts is the author of a recently-published book, "Deep Sea, High Mountain," which consists of true stories about the field work activities of the Coast and Geodetic Survey.

DAVID TAYLOR MODEL BASIN

Francois N. Frenkiel, Applied Mathematics Laboratory, served as chairman of the International Symposium on Fundamental Problems in Turbulence and their Relation to Geophysics, held at Marseilles, France, September 4-9. The symposium was sponsored by the International Union of Geodesy and Geophysics and the International Union of Theoretical and Applied Mechanics.

GEOLOGICAL SURVEY

Joseph J. Fahey presented a paper on "Wegschleiderite, a New Saline Mineral from the Green River Formation, Wyoming," during the annual meeting of the Mineralogical Society of America, Cincinnati, November 2-4.

Alfred M. Pommer has been appointed chairman of the Biochemical Analysis Committee, Biomedical Sciences Division, Instrument Society of America.

Dorothy Carroll attended the first Coastal and Shallow Water Research Conference, Atlantic Regional Meeting, Baltimore, October 20-21. The conference was sponsored by the National Science Foundation and the Office of Naval Research.

During October, **Edwin W. Roedder** spoke on "The Study of Fluid Inclusions in Minerals" to the Geology Departments of Lehigh University and Princeton University, and to the Philadelphia Mineralogical Society.

Raymond L. Mace attended a symposium on ground-water resources in arid zones, sponsored by the International Association of Scientific Hydrology in Athens, Greece, October 9-20. In a meeting with the Council of the Association he discussed possibilities of world-wide cooperation in a proposed International Decade of Scientific Hydrology. He also attended a meeting of a working group of the American Standards Association, which is studying criteria for selection of sites for disposal of low-level radioactive waste, in Chicago November 6-7.

UNIVERSITY OF MARYLAND

John S. Toll, chairman of the Physics Department, is on leave during 1961-62. He is spending the first semester of the academic year at Lund, Sweden, where he is engaged in research work at the Institute for Theoretical Physics. **Howard J. Laster** is acting chairman of the Department during Dr. Toll's absence.

S. Fred Singer, who is in charge of the space research program in the Physics Department, is on leave for research at the Jet Propulsion Laboratory of the California Institute of Technology, and later will spend some time at Princeton.

Harry D. Holmgren, formerly on the staff of the Naval Research Laboratory, has become an associate professor in the Physics Department.

Gianni Quareni, a high energy physicist at the University of Bologna, is visiting associate professor of physics for the present academic year. His wife, Angela Vignudelli, will serve as a postdoctoral research assistant in physics.

USDA, BELTSVILLE

C. H. Hoffmann, assistant director of the Entomology Research Division, was guest speaker at the 57th Annual Convention of the International Association of Ice Cream Manufacturers on October 27, in Washington. He spoke on "New Concepts in Controlling Farm Insects."

During October, **Lawrence Zeleny** attended meetings at Chicago, Dallas, Fargo, Fort Worth, Great Falls, Huron, and Kansas City, to explain and demonstrate to the grain trade and Department of Agriculture officials the use of the sedimentation test for estimating the bread-baking strength of wheat. This test will be used as a basis for loan premiums in the Department's 1962 wheat price support program.

F. P. Cullinan, associate director of the Crops Research Division, was awarded the Charles Reid Barnes Life Membership of the American Society of Plant Physiologists at the annual banquet of the Society during the AIBS meetings at Purdue University, Lafayette, Ind., in August.

E. F. Knipling, director of the Entomology Research Division, and R. C. Bushland, investigations leader of Livestock Insect Research at the Kerrville (Tex.) laboratory of ERD, were joint recipients of the John Scott Award for their part in the development of the sterile male method for screw-worm eradication. The award was presented during the meeting of the Eastern Branch of the Entomological Society of America, held in Baltimore in October.

Myron S. Anderson, ARS, attended the National Meeting of the American Chemical Society in Chicago in September. He presented a paper entitled, "A Look at Composts," before the Division of Fertilizer and Soil Chemistry.

Arthur W. Lindquist was a recipient of the Department's Distinguished Service Award this year "for original research and forceful leadership in improving the health and welfare of man and livestock through the development of new methods for controlling insects of medical and veterinary importance." Dr. Lindquist has been chief of the Insects Affecting Man and Animals Research Branch, ARS, since 1953. During World War II he was a member of the team at the Department's Orlando laboratory, which developed a method of impregnating clothing with chemicals to protect military personnel from disease-carrying insects, for which the team received the Department's Distinguished Service Unit Award in 1947.

USDA, WASHINGTON

Edward H. Graham, director of Plant Technology, Soil Conservation Service, has been appointed representative of the Ecological Society of America to the International Union of Biological Sciences.

On October 30, **George W. Irving, Jr.,** was toastmaster for the Harvey W. Wiley Award Banquet sponsored by the Association of Official Agricultural Chemists at the Shoreham Hotel.

Hazel K. Stiebeling, director of the Institute of Home Economics, spoke at the Food and Nutrition Conference for Students and Alumnae of the School of Home Economics, Ohio State University, on October 21. Dr. Stiebeling spoke on "Opportunities in Nutritional Sciences" at a conference commemorating the Land-Grant Centennial at Virginia Polytechnic Institute, November 3-4.

UNCLASSIFIED

Donald B. McMullen, leader of the WHO Bilharziasis Advisory Team and on leave from the Walter Reed Army Institute of Research, will continue his association with Endemo-epidemic Diseases, Division of Communicable Diseases, World Health Organization, at Geneva, Switzerland, until the end of 1962. This inter-regional team, organized in 1958, has reviewed the bilharziasis problem in 16 countries, evaluated control measures, and attempted to coordinate them with agricultural and water resources development.

Bernard Frank, professor of watershed management at Colorado State University, Fort Collins, a former member of the Forest Service, in Washington, has been awarded a grant by the Conservation Foundation of New York to prepare a textbook—the first of its kind—on watershed management. Collaborating with Mr. Frank is Robert E. Dils, leader of the Colorado State University Cooperative Management Unit. The book is scheduled for publication in 1963.

DEATHS

Paul Renno Heyl died in October at the age of 89. Dr. Heyl was born in Philadelphia and received both his bachelor of science and Ph.D. degrees from the University of Pennsylvania. He taught physics in Philadelphia and Reading from 1898 to 1910, then joined a commercial research firm in New York City. In 1920 he joined the Bureau of Standards, where he became chief of the Sound Division. He retired in 1942, but served as a consultant in physics and mathematics for several Government and industrial projects during the War. His invention of the earth induction compass first made aerial navigation possible.

AFFILIATED SOCIETIES

Acoustical Society of America, Washington Chapter

A demonstration talk by Edith Corliss, NBS, entitled "Through the Hearing Aid," was held on November 20 in the Exhibit Room of the Industrial Building, NBS. An informal dinner at the Cafe Burgundy preceded the meeting.

American Institute of Electrical Engineers, Washington Section

The general meeting on October 11 presented Wm. J. Ellenberger, DOD, on the topic, "Planning the Structure of the Engineering Profession

to Achieve Unity." We are interested to note in the November bulletin of the Section a paragraph to the effect that a movement is underway to combine the AIEE with the IRE as a single engineering society, which may bear on the same general issue.

William B. Kouenhoven of Johns Hopkins, addressed the Section on November 9 on the subject, "The Effect of Electric Shock on Humans."

This year's Student Night, November 14, featured a tour of the National Bureau of Standards, the first time in many years that certain of the laboratories have been open in the evening for an event of this kind. Chester H. Page, former editor of the *Journal*, highlighted some of the research and development activities of the Bureau in a talk beginning at 7:30 p.m.

The Aero Space Technical Group sponsored a visit on November 15 to the Goddard Space Center at Greenbelt.

American Meteorological Society, D. C. Branch

Richard J. Reed of the University of Washington, presently visiting scientist at the National Meteorological Center, addressed the Branch on "Suprises in the Equatorial Stratosphere." He dealt particularly with wind and temperature fluctuations which oscillate in a cycle that does not appear simply connected with annual transit of the sun across the equator.

American Society of Civil Engineers, National Capital Section

The October luncheon meeting, on the 24th, heard Archie N. Carter, of Carter, Krueger & Associates, speak on the "Local Impact of Federal Programs," with special reference to such projects as the St. Lawrence Seaway, the Atomic Energy program, and the Interstate Highway System.

Rep. Robert F. Ellsworth (Kansas) addressed the November dinner meeting of the Section on the topic, "An Engineer in Politics."

On November 28, at the regular luncheon meeting, Maj. Gen. James B. Lampert, Corps of Engineers, in a talk entitled "Civil Engineering in Missile and Space Programs," considered the impact of these construction programs on the Civil Engineering profession, particularly from the standpoint of management.

The November "Civil Engineer" notes that 120 members of the Section have volunteered to help area high schools in such instances as the recent institute on radioactivity attended by science teachers.

American Society of Mechanical Engineers, Washington Section

Eldon E. Sweezy, management consultant to the Department of the Army and an instructor at American University, addressed the October 26 meeting of the Section on "Managers of Creative Engineering," dealing with scientific organizations, laboratories, and engineering, *per se*.

Much publicity, naturally, attended the presentation on November 9, by Antole Kuznetsov, Third Secretary of the Soviety Embassy, of a talk on "Achievements of Soviet Industry," and a film on the flight of Maj. Titov, the cosmonaut.

Chemical Society of Washington

The November 9 meeting, held at Walter Reed Institute of Research, featured a panel discussion on "The Chemical Origin of Life," in which the participants were Philip H. Abelson of the Geophysical Laboratory and Sidney W. Fox of the Oceanographic Institute, Florida State University. Dr. Abelson spoke on "Chemical Reactions in the Primitive Environment," and Dr. Fox on "Origin of Protein Macromolecules and of Supramolecular Sysems."

Two topical group meetings were held before the general meeting. Alfred Burger of the University of Virginia addressed the Organic Group on "Medicinal Chemistry—Its Problems, Hopes, and Dilemmas," and H. W. Koch of the National Bureau of Standards addressed the Physical Group on "Research with High Energy X-rays and Electrons."

A record group of over 350 persons participated in the annual elections that preceded the general meeting. The following officers were elected for 1962: Alfred E. Brown, president-elect; Alphonse F. Forziati, secretary; and Leo Schubert, treasurer.

Columbia Historical Society

November 11 was the Annual Homecoming at the Heurich Memorial Mansion, 1307 New Hampshire Avenue, N.W.

"Old Washington Houses as Seen by an Outsider," was the subject of an illustrated talk on November 17 by Mrs. J. R. Longard, a member of the Old Houses Group of the University Women's Club of Halifax, Canada. She and her husband, an experienced photographer and associated with the Canadian Joint Staff, have walked the streets of Washington studying the architecture of 100-year old houses.

November 25 marked the opening afternoon reception, in the Powell Auditorium, of an exhibit entitled "Prints and Photographs of Washington During the Civil War."

Geological Society of Washington

"Paleontological Pitfalls," a group of short talks illustrating the diversity of paleontological work and some lapses and progress in its philosophy, with examples from recent history of the profession, constituted the program for November 8. Speakers were Erle G. Kauffman, U.S. National Museum, and Frank C. Whitmore, Mackenzie Gordon, Jr., Nicholas Hotton, III,

and William A. Oliver, all of the Geological Survey.

The regular program of November 29 included a 30-minute color film of the eruption of Kilauea, 1959-60, introduced by Edwin Roedder, and papers by Wallace E. Stener, Stanford University, on "Major Powell and the Beginnings of the Conservation Movement," and E. C. T. Chao, USGS, on "The Ries Crater of Southern Germany —Meteoric or Volcanic?"

Helminthological Society of Washington

Five papers constituted the program of the 382nd meeting of the Society on November 30 in Wilson Hall, NIH; "Variation in Susceptibility of Inbred Mice to Cepticercus fasciolaris," by A. W. Cheever; "The Effect of Dead Worms on the Development and Progress of Experimental Hepato-splenic Schisto-somiasis mansoni in Mice," by K. S. Warren; "In Vitro Studies on the Maintenance and Early Development of Dirofilaria immitis Microfilariae," by J. K. Sawyer and P. P. Weinstein; "The Nutritional State of the Host in Relation to Experimental Malaria Chemotherapy," by R. L. Jacobs; and "Metastatic Calcification in Rats Due to Hytakerol as Modified by Infection with Plasmodium berghei," by T. I. Mercado.

Insecticide Society of Washington

Two papers by members of the Entomology Research Division, USDA, were presented at the November 15 meeting of the Society: "10th Pacific Science Congress—Insect Problems in the Pacific Area," by L. F. Steiner, and "What is the Trend in Insect Control Agents?" by Stanley A. Hall.

Institute of Radio Engineers, Washington Section

At the general meeting, November 13, Paul H. Robbins, executive director of the National Society of Professional Engineers, spoke on the subject, "Your Technology Is Not Enough."

Technical meetings during the month of November included the following: November 1—"Application of Computer Systems to Air Traffic Control"; November 7—"How Smart Can You Be—Is Electronic Sophistication Debasing our Defense Picture?"; November 14—"High Power Microwave Switching, Using Gas and Vacuum Techniques"; November 20—"The Possible Use of VHF Television Frequencies for Land Mobile Communications"; and November 21—"Solution of a Space Rendezvous Problem."

Medical Society of the District of Columbia

The 29th Annual Scientific Assembly of the Medical Society of the District of Columbia was scheduled for November 27-29, with sessions on cholesterol and its metabolism, tranquilizers and antidepressants, and the "The Physician's Role During the First 30 Minutes," the last concerned with accident victims of all kinds. Panel discussions in the afternoons treated as subjects: diet and atherosclerosis, use of tranquilizers and antidepressants, and responsibility in assuming emergency medical care. A number of specialty meetings on cardiac problems, radiology, surgery, malignancy, internal medicine, and anesthesiology completed the assembly.

Most of the events cited in the monthly list of Current Medical Events are, understandably, of a technical nature. We note, however, a panel discussion on November 8 on the general topic, "The Relation of Religion to Medicine," a paper at Columbia Hospital on "Medical Legal Matters," one at Sibley Hospital on "Soma's Influence on the Psyche," and a closed session at Georgetown University which considered the place of genetics in the curriculum of the medical student.

Philosophical Society of Washington

On November 25, Robert P. Madden, NBS, addressed the Society on the subject, "Emancipation of Far Ultraviolet Physics."

Society of American Military Engineers, Washington Post

Harris B. Stewart, Jr., Coast and Geodetic Survey, was featured speaker at the November 20 luncheon meeting, and presented a talk on "The Challenge of Oceanography."

CALENDAR OF EVENTS

Events which will take place, so far as we can determine at the time of writing, are noted below. Where no indication of the program other than date appears, it will in most instances be a regularly-scheduled meeting of the society. Last-minute changes in time and place, or emergency cancellations, cannot be reflected here.

December 11—American Society for Metals, Washington Chapter

Joint meeting with the American Welding Society. "Diffusion Bonding," with a speaker from the Battelle Memorial Institute, Columbus, Ohio, AAUW Building, 2401 Virginia Avenue, N.W., 8:00 p.m.; dinner at 6:30 p.m.

December 11—Institute of Radio Engineers, Washington Section

Museum of Natural History, 8:00 p.m.

December 12—American Society of Civil Engineers, National Capital Section

Powell Auditorium. Dinner, 6:30 p.m.; program, 8:00 p.m.

December 13—American Institute of Electrical Engineers, Washington Section

"Air Safety," by James T. Pyle, Federal Avia-

tion Agency.

PEPCO Auditorium, 10th and E Sts., N.W., 8:00 p.m.

December 13—Geological Society of Washington

Powell Auditorium, 8:00 p.m.

December 14—Chemical Society of Washington

Topical Group meetings at 5:00 p.m.: *Biochemical*, Paul L. Day, Food & Drug Administration, "The Science of Biochemistry: Past, Present, and Future"; *Organic*, Milton Orchin, University of Cincinnati, "Cis-trans Isomerization Catalyzed by Selenium"; *Physical*, George K. Fraenkel, Columbia University, "Determination of Electron Distributions from Electron Spin Resonance Spectra"; *Analytical*, Bourdon F. Scribner, NBS, "An Analytical Tour of West Europe." At NIH, various locations.

Cocktails at 6:00, dinner at 6:45, at Naval Medical Center.

General meeting at 8:15: Karl A. Folkers, Merck and Company, "Newer Aspects of Chemical and Biological Research on Coenzyme Q." At NIH, Clinical Center Auditorium.

December 14—American Society of Mechanical Engineers, Washington Section

Regular meeting in area of nuclear engineering and heat transfer.

PEPCO Auditorium, 10th and E. Sts., N.W., 8:00 p.m.

December 15—Helminthological Society of Washington

Open program meeting featuring notes from the floor.

American University, 8:00 p.m.

December 18—Acoustical Society of America, Washington Chapter

National Bureau of Standards, 8:00 p.m.

December 18—Society of American Military Engineers, Washington Post

YWCA, 17th and K. Sts., N.W. Luncheon at noon.

December 19—Anthropological Society of Washington

Room 43, Museum of Natural History, 8:15 p.m.

December 20—Insecticide Society of Washington

Symons Hall, University of Maryland, 8:00 p.m.

December 20—Washington Society of Engineers

Powell Auditorium, 8:00 p.m.

December 21—Society of American Foresters, Washington Section

YWCA, 17th and K Sts., N.W. Dinner meeting at 6:30 p.m.

December 21-22—Philosophical Society of Washington

Christmas Lectures by Frank D. Drake, National Radio Astronomy Observatory, Green Bank, W. Va.

Lisner Auditorium, George Washington University, 8:00 p.m.

December 26—American Society of Civil Engineers, National Capital Section

"Highways in Russia," Francis Turner, Acting Commissioner of Public Roads.

YWCA, 17th and K Sts., N.W. Luncheon at noon.

December 26—Society of American Bacteriologists, Washington Branch

Walter Reed Medical Center, 8:00 p.m.

December 27—American Society of Civil Engineers, National Capital Section

Christmas party.

December 28—American Society of Mechanical Engineers, Washington Section

PEPCO Auditorium, 10th and E Sts., N.W., 8:00 p.m.

BOARD OF MANAGERS MEETING NOTES

The Board of Managers held its 540th meeting on October 3 at the National Academy of Sciences, with President Abelson presiding.

The minutes of the 539th meeting were approved with minor corrections.

Announcements. Dr. Abelson announced appointment of John K. Taylor as chairman of the Committee on Encouragement of Science Talent, for the remainder of the Academy year, in place of Lloyd N. Ferguson; of Herbert L. Ley, Jr., to the Medical Sciences Panel, Membership Committee, through 1963, replacing Webb E. Haymaker; and of Norman Bekkedahl as chairman of the Committee on Awards for Scientific Achievement.

Meetings Committee. For Chairman Frenkiel, the secretary announced that at the October 19 general meeting, T. Dale Stewart of the Smithsonian Insitution would speak on "The Last Phase of Human Evolution."

Dr. Abelson reported on progress in setting up the Institute on Isotopes and Radioactivity, planned for the first week of November. (See also story elsewhere in this issue.) Arrangements to permit attendance by Academy members as well as science teachers were under consideration.

Membership Committee. The secretary announced the names of eight new Academy members, elected pursuant to the Board's action at

its June meeting, as follows: Clyde S. Barnhart, Chester R. Benjamin, Francis J. Heyden, Ralph E. Lapp, Morris Lieberman, Robert M. Page, Vera C. Rubin, and James H. Trexler.

Committee on Awards for Scientific Achievement. Dr. Abelson urged that nominations for awards for scientific achievement, to be presented at the annual meeting of the Academy next January, be submitted to Dr. Bekkedahl as early as possible.

Committee on Grants-in-aid. Dr. McPherson announced a grant of $100 to Carl Miller for a research project, pursuant to previous action by the Board. The Board approved another grant, in the amount of $55, to Thomas G. Hoffman of Fairfax High School, for a project on ion exchange resins.

Dr. McPherson brought up a matter, discussed in the Policy and Planning Committee, concerning the use of funds that AAAS has been granting to WAS and other U.S. science academies for support of research. A letter from Dr. Abelson to AAAS was quoted, expressing the view that such funds granted to the Washington Academy should not be restricted to use by secondary school students, but should be applicable to both senior and junior scientists, in accordance with need and probability of effective use. Mr. Braaten brought up the point that AAAS funds might well be used to reimburse the Academy for the $300 it gave for support of summer research by high school students under the mechanism developed by Dr. Schubert. Dr. McPherson indicated that he would obtain an opinion from AAAS on this question.

Policy and Planning Committee. Dr. Campbell discussed the background of an application made by the Washington Section of the Institute of Food Technology, for affiliation with the Academy. Dr. McPherson moved that the question of affiliation be placed on the ballot in the December elections, for approval by the membership. The motion was passed.

Dr. Campbell reported the Committee's recommendation that annual dues be raised to $10 for resident members and $7.50 for nonresident members. He reviewed the budgetary situation and pointed out that expenses for the current year were still exceeding income, despite the fact that the Academy's paid staff officer was released last March. He pointed out that the *Journal* was operating on as stringent a budget as could be expected, and that any expansion could be effected only at increased cost. He spoke, also, with regard to the matter of assistance to the officers, indicating that it was quite necessary that the time-honored system of relying on the elected officers to supply clerical and other assistance from their own offices be supplemented by central office activities. He pointed out that it was becoming increasingly difficult to induce proposed nominees to accept nomination to office in the face of the very strenuous responsibilities which a number of these offices carry.

Dr. McPherson moved that the dues increase be put to a vote of the membership. After a general discussion, and a review of the financial situation by Mr. Braaten, the motion was unanimously passed and the secretary was instructed to include the question in the annual ballot.

Committee on Encouragement of Science Talent. Dr. Schubert summarized the contents of a comprehensive report that he had prepared, concerning the Committee's activities in connection with the program for summer research by high school students. Briefly, the program was an entire success. (See also the story, "Joint Board Sponsors Student Research Program," in the November *Journal*, page 117.)

Committee on Science Education. Dr. Taylor summarized recent activities of the Committee and the Joint Board on Science Education. He indicated that a meeting set up through Dr. Seeger in the early summer had resulted in a very successful discussion between about 50 representatives of five different academies of this area. (See also the story, "WAS Holds Interacademy Education Conference," in the November *Journal*, page 119.) It was his feeling that the Academy and the Joint Board were leading the country in science education efforts, and that the other state academies were looking to us for guidance in this field. He reported that the budget for the year had been cut considerably, amounting to $26,725. Since on October 16 there would be a deadline for re-application for funds from NSF, it was planned to apply for only $10,000 for the coming year and to omit certain items of school support which had swelled the budget of prior requests. He felt, however, that it was also necessary to request that *The Reporter*, previously supported by a grant from the Meyer Foundation now be funded through NSF. He requested that NSF be asked to permit diversion of present funds to recover the current expenses of the magazine; the Board approved this request.

Special Committee for Directory. Dr. Campbell stated that, at Dr. Abelson's request, he had recommended the appointment of R. W. Krauss of the University of Maryland as chairman of a special committee to investigate the feasibility of preparing a joint directory of the membership of the Academy and affiliated societies.

Nominations. After the Board had adjourned, the delegates of the affiliated societies remained to act as a Nominating Committee, under the chairmanship of the senior delegate, Lawson McKenzie of the Philosophical Society, to draw up a slate of officers for 1962.

JOINT BOARD ON SCIENCE EDUCATION

At its October meeting, the Joint Board set its sights high and voted to aim at a record budget of $14,375 to operate its program during the 1961-62 school year. This includes a *normal budget* of $12,575 and a *supplemental budget* of $1,800 to provide for its planned programs.

The summer training program, science fairs, and publication of *The Reporter* are the major items in the budget with $4,000, $3,325, and $2,500 being allotted respectively for these activities. The school contacts program was allotted $1,000, while $750 was budgeted for science teacher awards. The Committee on Women in Science received a budget of $250, while the Frontiers in Science lectures account for $150. Various administrative expenses account for $225.

The supplemental budget would provide $1,000 to expand and improve the summer training program, and $800 to permit sending a full quota of representatives to the National Science Fair.

The Board's income includes $6,500 from grants to finance the summer training program and publication of *The Reporter*. Professional societies and industrial organizations, as in the past, are expected to contribute some $5,200. Sale of project books and other sources of revenue are expected to amount to another $875. This leaves a balance of $1,800 that must be obtained from other sources if program goals are to be fully realized.

Part of the increased budget is due to the fact that the science fair will be held on the Pacific coast. The larger portion is the result of *more services* being rendered to *more people*. It is hoped that regular contributors will be as generous as possible, and that new donors will join their ranks to insure the success of the JBSE's 1961-62 program.

The book, "Project Ideas for Young Scientists," published by the Joint Board in October 1960, has exhausted its first printing of 3,000 copies. This 140-page book contains more than 400 investigative-type projects suggested by local scientists as applicable to the secondary school level. It has received very favorable reviews and has been distributed nationally. In fact, some 100 copies have been sent to various international purchasers.

In view of continuing orders, the Board approved a second printing of 1,000 copies of the book. Meanwhile, plans are being made to prepare a revised and enlarged edition for publication probably in the fall of 1962. Members of the Academy interested in contributing to the new edition are invited to contact the editor, John K. Taylor, National Bureau of Standards, Washington 25, D.C., for further details.

The series of conferences on the teaching of science and mathematics in secondary schools is in full swing. An inter-academy conference (reported in the November number of the *Journal*), and conferences concerned with biology, physics, and general science (Northern Virginia area) have already been held. In addition, plans have been made for the following conferences: Chemistry—January 20; General Science (D.C. area)—February 17; General Science (Maryland area)—March 10; Women in Science—March 31; Mathematics—April 14; Elementary School Science—early May.

A special conference devoted to career counseling in engineering is being planned for January 6.

Invitations to attend these all-day meetings are issued to those known to be interested in science education. The Joint Board is always glad to add new names to its list and would be glad to know of those who would like to attend any of the conferences mentioned. Invitations will be extended insofar as possible.

WASHINGTON JUNIOR ACADEMY OF SCIENCES

The Washington Junior Academy of Sciences will hold its annual convention at the Hamilton Hotel on December 28, from 9:30 a.m. to 4 p.m. Several hundred members and other students are expected to attend to hear papers presented by some 40 students on various subjects in science and mathematics.

The convention will consist of four concurrent morning and afternoon sessions in the fields of biology, chemistry, mathematics, and physics, devoted to student papers. A luncheon, for all attendees, will be partially subsidized by the WJAS to encourage a large attendance.

The Junior Academy is also planning a workshop for science club officials to be held early in January. Originally scheduled for November, it was postponed because of several conflicts that would have prevented a large attendance. The conference, patterned after the very successful one held during December 1960, will be concerned with various activities carried on by the clubs, as well as consideration of ways in which club programs can be strengthened. A speaker from the Joint Board will be present to discuss ways in which it can help science clubs.

SCIENCE AND DEVELOPMENT

A handy gadget that will make enough fresh water to keep survivors of sea disasters from dying of thirst has been developed by the Army Engineer Research and Development Laboratories at Fort Belvoir. It oper-

ates with heat from the sun's rays or from the body of an individual sitting on it. It consists of a sheaf of five sheets about the size of standard typewriter paper. Each sheet is made up of a black plastic film on top, piece of paper toweling or cloth, then a water-repellent screen, a sheet of aluminum foil and a cloth backing for the foil. A sponge to collect the fresh water completes the kit. The sheets are dipped in the ocean, excess water is drained and the aluminum foil wiped dry. The sheets are reassembled with the black plastic film on top and exposed to the sun or body heat. The heat penetrates the aluminum foil which is cooled by the bottom saltwater soaked cloth. Fresh water condenses on the foil. The survivor uses the sponge to soak up the water. There may be only a few drops, but enough to keep a person alive.

American University has set up a cancer research laboratory at Sibley Memorial Hospital. The laboratory was established under an $85,000 grant from the National Cancer Institute. Research will be conducted with pregnant mice to determine why fetuses and tumors of fetal origin are not rejected by the mother as would be other foreign "skin grafts." If tolerance to foreign substances can be induced or destroyed at will, the findings could be applied to many medical problems including leukemia, pregnancy diseases, replacement of defective tissues and organs, and fetal-originated tumors.

A new class of non-magnetic alloys that are corrosion resistant and have almost the hardness of tool steel has been developed at the Naval Ordnance Laboratory. The new alloys are intermetallic compounds formed by a combination of titanium and nickel, and have been named Nitinol. The alloys are strong and tough, having been tested up to 43 foot-pounds impact strength. The toughness increases as temperature decreases, yet the alloys are suitable for use up to about 1200°F. The specific gravity of 6.45 means that the alloys offer strength without adding weight, and are useful for aircraft, tools, and other applications. Nitinol has a very high mechanical vibration capacity at room temperature, which decreases rapidly as temperature is increased. This characteristic may make it useful in temperature-sensing devices.

A tidal current survey is being made in the Potomac between the South Capitol Street Bridge and Dahlgren, Va. The survey is being made by the Survey Ship *Mariner* of the Coast and Geodetic Survey. Results of the survey will furnish mariners with up-to-date information on the direction and velocity of the currents under certain bridges, at river turns, and at narrow stretches where changes in the velocity have been known to exist. The information will be incorporated into the C&GS Tidal Current Tables. These tables enable pilots of tugs and seagoing vessels to navigate more safely, and are used in planning bridge construction, dredging operations and other projects.

The Department of Interior announced on September 22 that a geological survey of potential ground water supplies of Washington, D.C., and adjacent areas has been completed. The report has been placed in the files and is available for public examination. While the major requirements of the area are met by surface water considerable ground water is used in fringe areas not reached by city supplies. Ground water throughout the study area is generally satisfactory for domestic and industrial use but in some places, excessive iron and corrosiveness are problems.

A direct and rapid test for nutritive value of feeds has been developed by the Department of Agriculture. The test measures and defines the parts of livestock feed that provide body energy and growth. The new test takes only about five hours, whereas the old method required about two days. The new method may indicate the nutritive value of feeds in terms of meat or milk production. It also may be useful for gauging the loss of nutrients in feeds heated excessively during drying.